Nov. 20, 1923. 1,474,710

R. GRIER

LUNG PROTECTOR

Filed May 26, 1920

Fig. 1.

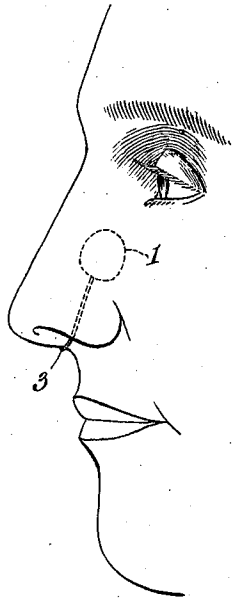


Fig. 2.

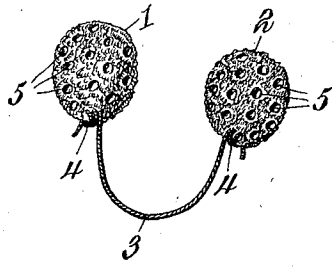


Fig. 3.

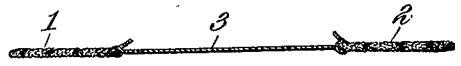


Fig. 4.

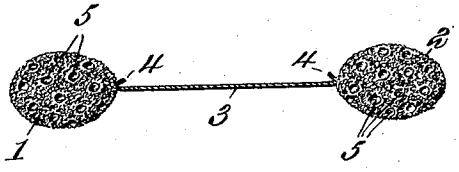
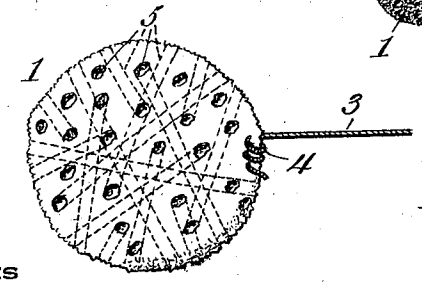


Fig. 5.



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UNITED STATES PATENT OFFICE.

ROBERT GRIER, OF HAZLETON, PENNSYLVANIA.

LUNG PROTECTOR.

Application filed May 26, 1926. Serial No. 384,448.

To all whom it may concern:

Be it known that I, ROBERT GRIER, a citizen of the United States, residing at Hazleton, in the county of Luzerne and State of Pennsylvania, have invented a new and useful Lung Protector, of which the following is a specification.

This invention refers to lung protectors and its object is to provide means for insertion in the human nose to intercept dust or other like matter carried by the air to prevent the passage of such matter to the lungs during inhalation.

Air, especially in cities, is more or less charged with particles of dust and with disease germs, and while the human nose is provided with natural protection preventing the free passage of such matter to the lungs, such protection is often inefficient. In the open country the deleterious matter is usually so diluted as to cause little or no harm, but in cities, or in places of crowded assemblage, the dust, though ordinarily not visible, is too thick to be taken care of by the natural protecting means growing in the nasal passages.

In some industries, such as coal mining, metal working, grinding, milling or the like the effects of dust is often serious and sometimes fatal to human beings, and masks which are always more or less obtrusive are employed to prevent access of the floating dust to the lungs.

There are also occasions, as in disease epidemics, where the disease is transmissible through the air, where the transmission of the disease may be prevented by a filtering action on the air.

In order that the use of the preventative means may be rendered popular and therefore correspondingly efficient, the invention contemplates the use of a filtering material such as sponge, which may be readily introduced into the nostrils and which has the faculty of absorbing moisture and swelling because of such absorption, wherefore a plug of the sponge will hold its place in the nostrils without the necessity of any holding means, except that the sponge plugs for the separate nostrils be secured together by a piece of thread facilitating the removal of the plugs and preventing them from rising in the nostrils beyond a predetermined point, because of the engagement of the junction thread with the septum of the nose.

While the sponge is a more or less porous substance it is also more or less obstructive to the passage of air through it, and yet in order to serve the purpose intended it should be quite free to the passage of air in breathing. For this purpose the sponge plugs have numerous holes punched in them in various directions, wherefore so little obstruction is offered to breathing that the presence of the plugs is not noticeable to the user, and, since the plugs are located well up into the nostrils, the presence of the plugs is not observed by others.

The invention will be best understood from a consideration of the following detailed description taken in connection with the accompanying drawings forming part of this specification, with the understanding, however, that the invention is not confined to any strict conformity with the showing in the drawings, but may be changed and modified so long as such changes and modifications mark no material departure from the salient features of the invention as expressed in the appended claim.

In the drawings:

Fig. 1 is a view showing the application of the invention to the human nose.

Fig. 2 is a perspective view of the protecting device ready for application to the nostrils.

Fig. 3 is a flattened out view of the protecting device when the sponge is dry and before it is applied to the nostrils.

Fig. 4 is a view similar to Fig. 2 but with the sponge plug seen at about right-angles to the showing of Fig. 2.

Fig. 5 is a view of one of the sponge plugs, on a larger scale than natural, and showing the various directions of artificially produced passages through the sponge.

Referring to the drawings there are shown two sponge plugs 1 and 2, the sponge being considered as the best material to use for the purpose, since the sponge may be compressed into small compass and will retain such small size when dry, and is cheap, be-

sides having the capability of swelling in the presence of moisture and therefore occupying considerably more space and being more or less elastic when moistened. The sponge plugs 1 and 2 are joined by a thread 3 which may be formed preferably of fiber and sewed into or otherwise joined to or joining the sponge plugs. The thread also has the advantage of being cheap so that the entire structure may be made very cheaply and, when used as long as desired, may be thrown away since the devices may be furnished at such extremely small cost that there is no necessity to cleanse them and preserve them. It is not even necessary to tie the ends of the thread strand 3 to the sponge plugs 1 and 2 for two or three stitches of the thread may be taken in the sponge plugs as indicated at 4, this being found to be ample for the purpose of preventing the thread ends from pulling out. The sponge plugs remain in a moist condition because of the natural moisture of the breath passing through the plugs.

Because of the resistance of sponge to the ready flow of air therethrough, it is found necessary to punch or perforate the sponge plugs with numerous passages 5 in different directions and intersecting to some extent. These passages may be quite small with their walls sufficiently irregular to be more or less in the path of the currents of air caused by breathing, and the sponge walls being quite moist both by initial moistening and by absorption of the moisture from the outflowing breath, particles of dust of various kinds engage and stick to the walls of the passages through the plugs and are thereby arrested in their course toward the lungs and are retained by the plugs.

In Fig. 5 the sponge plug, which may be considered as plug 1, is shown as provided with many perforations 5, but it is not necessary that there should be as many perforations as indicated, although the invention is not confined to any particular number of such perforations. Nor is it at all obligatory that the perforations should be of a certain size, for in practise they are quite small, the only requisite being that in number and size the perforations shall permit the free flow of air in breathing with the perforations small enough to arrest the particles of dust passing toward the lungs through the nostrils.

When the lung protector is installed it is moistened sufficiently to cause the sponge to swell to an extent to lodge in the nostrils. The swelling of the sponge, however, is insufficient to cause any obstruction to the passages through the sponge so that free flow of the breath is unobstructed. Workers in dust laden atmosphere, as in mills of various kinds, or in mill working where grinding and the like occurs, the moist walls provided by the passages through the sponge collect the dust and hold it back from the lungs. In crowded assemblages where there is liability of rebreathing exhalations from the lungs of others anything carried by the air and which might be harmful to the person breathing it is caught by the sponge while in the moist condition and readily adheres to the sponge, thus being prevented from reaching the lungs of the breather. The capacity of the sponge plugs is amply sufficient to last for a considerable time, say for a day, so that it is not necessary to replace the lung protectors except at infrequent intervals. This may be done by removing the plugs at night while the person is at rest and placing fresh plugs in the nostrils in the morning. Again when a person is liable to be subjected to conditions where disease is present the protector may be used only during such time. Where the person is subjected to bad working conditions the protector may be used only during the prevalence of such conditions. In any event the protector may be completely discarded under other conditions, although it is so unobtrusive that it may be worn without annoyance of any kind for longer periods. In fact, the wearer may be entirely unconscious of the presence of the protector and may wear it for a much longer period than a day. However, the device is of such extremely cheap construction that economical reasons need not prevent the discarding of the protector at more frequent intervals than once a day.

The thread 3 constitutes a convenient means for removing the sponge plugs when desired and for preventing the insertion of the plugs to more than a limited extent into the nostrils. The sponges when swollen by moisture readily hold their places and are cool feeling so that the user quickly becomes unconscious of their presence.

Aside from the protection afforded to the user against the dangerous qualities of dust and the like, there is also protection against the breathing in of disease germs, for the moist sponge will stop the passage of such germs from the nostrils into the lungs. Moreover, the protector may be employed as a carrier for medicaments of various kinds whereby the mucous membranes and the lungs to which they lead may be treated, the preparations for which the sponge plugs may be utilized as carriers depending upon the character of the disease with which such membranes may be afflicted.

The invention is also particularly useful in connection with automobile riding and, to a less extent, in any form of travel where dust is encountered, and its extremely small cost permits the use of the invention where more elaborate devices might prove prohibitive because of expense.

What is claimed is:

A lung protector comprising a pair of sponge plugs connected by a thread having its ends secured to the respective plugs, whereby the latter may be introduced into the nostrils of the user, with the thread embracing the septum of the nose, said sponge plugs having minute passages artificially formed therethrough in different directions.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature.

ROBERT GRIER.